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Census of the three shag species in the Chatham Islands

MIKE BELL
DAVE BELL
Wildlife Management International Limited, PO Box 14-492, Wellington, New Zealand

Abstract During the 1997/98 breeding season we counted the breeding populations of Chatham Island shag (*Leucocarbo onslowi*), Pitt Island shag (*Stictocarbo featherstoni*) and black shag (*Phalacrocorax carbo*). Surveys, on foot or from kayaks and fishing boats, of all potential shag nesting habitat within the Chatham Islands provided the first complete census for shags breeding there. The breeding population of Chatham Island shag was 842 pairs in 10 discrete colonies, while there were 729 breeding pairs of Pitt Island shag at 63 locations throughout the group. Given that the counts of the endemic shags are for the total world populations, these species are extremely rare. The black shag breeding population was 233 pairs, in 5 locations on Chatham Island only. Comparisons with counts made during the 1960s and 1970s by visiting ornithologists suggest that the populations of Chatham Island shag and black shag have remained relatively stable, although the distribution of colonies of both species has changed significantly. Too few previous counts of Pitt Island shag colonies were available to determine a population trend. All 3 species are threatened in the Chatham Islands by destruction of nesting habitat, disturbance of nesting colonies, human persecution, and predation by introduced mammals.

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INTRODUCTION

Only 3 species of shag have been recorded from the Chatham Islands, all of which presently breed there. Two species, the Chatham Island shag *(Leucocarbo onslowi)* and the Pitt Island shag *(Stictocarbo featherstoni)* are endemic to the group. The third species, the black shag *(Phalacrocorax carbo)* is found throughout Eurasia and is widespread in Australasia.

Despite 2 species being confined to the Chatham group, little information has been collected on the shags. No systematic count of colonies covering all islands within the group during 1 season has been attempted before. However, Robertson & Bell (1984) estimated the populations of the 2 Chatham Island endemics, their results indicating that the breeding population of each was under 1000 pairs. Most data have been collected during casual visits by ornithologists. The most useful counts are those by B.D. Bell, D.V. Merton, and C.J.R. Robertson during the 1960s and 1970s (Imber 1994), from which rough estimates of the populations of Chatham Island shag and black shag could be made. As a result, some comparisons are possible with the counts reported here and population trends for the 2 species can be assessed.

This paper presents the first censuses of shag species in the Chatham Islands. It was carried out during the 1997/98 breeding season, and covered all islands within the group. Details of colony size and location for all 3 species were obtained.

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METHODS

Breeding pairs of black shag were counted between July and September 1997, when most birds were incubating or raising young. All lakes (except 4 lakes in the southern tablelands of Chatham Island) and major watercourses on Chatham and Pitt Islands were surveyed. Surveys were completed either on foot, by kayak, or both.

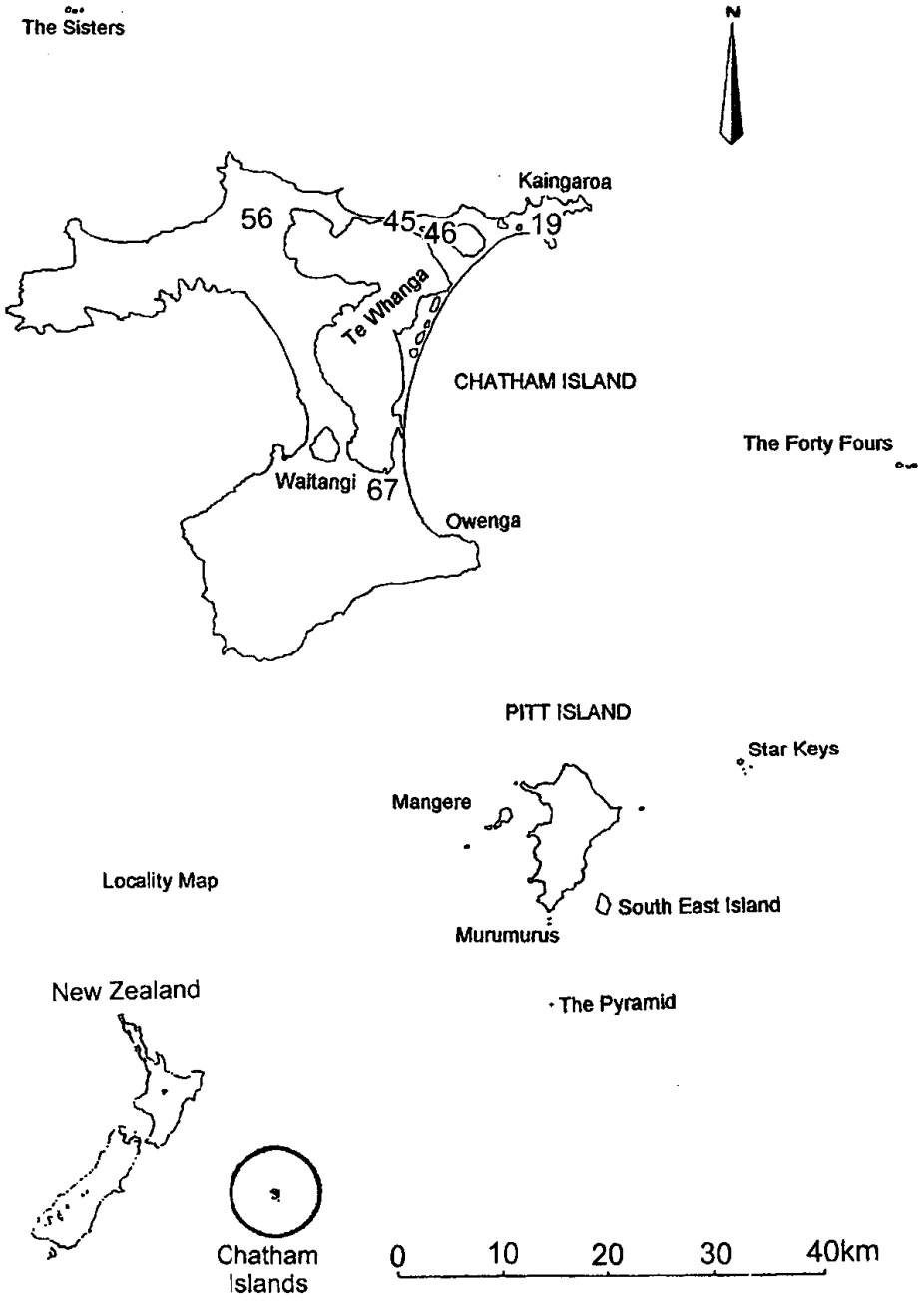

Fig. 1 Location of black shag (*Phalacrocorax carbo*) colonies with number of nests in 1997/98.

The breeding populations of Chatham Island and Pitt Island shags were surveyed from October 1997 to January 1998. Breeding activity at colonies was at a peak during this period. The entire rocky coastline of all islands in the group and of Te Whanga lagoon was surveyed. The coastline accessible by land was surveyed on foot; inaccessible cliffs were covered from a dinghy, dive boat, or fishing vessel.

As it was impossible to check the contents of many nests within each colony (i.e. those nests in tall trees or on inaccessible cliff ledges), the number of apparently occupied nests was counted as an estimate of the number of breeding pairs. Time constraints meant that it was not possible to repeat counts at many colonies. Where repeat counts were possible, the highest count was used.

RESULTS and DISCUSSION

Black shag *Phalacrocorax carbo*

A total of 233 breeding pairs of Black Shag were found in 5 colonies on Chatham Island. The colonies were at Lake Kaimoumi (46 nests), Lake Wharemanu (45), the Flax Pond (a small lake south west of Lake Rotokawau, 56), Okawa Point lake, (19) and on the lower Te Awainanga River (67) (Fig. 1). Nests at the colony on the

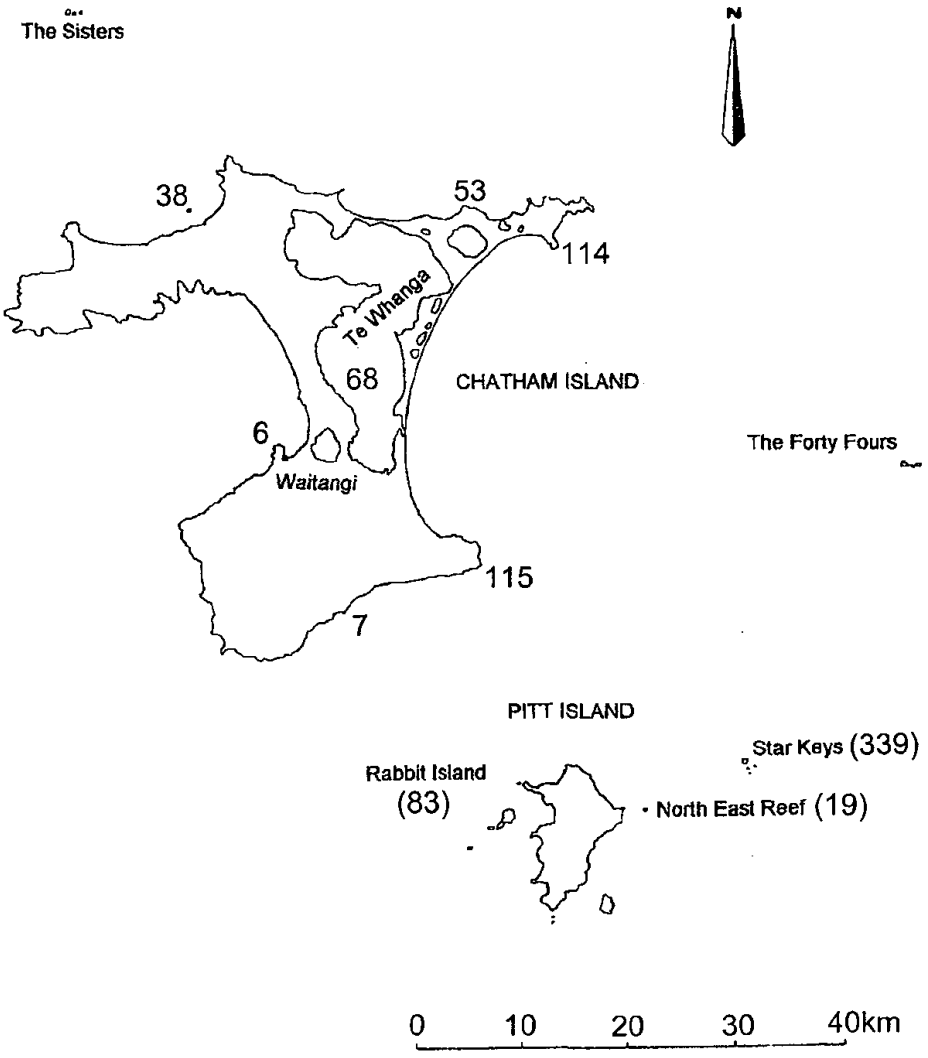

Fig. 2 Location of Chatham Island shag (*Leucocarbo onslowi*) colonies with number of nests in 1997/98.

Te Awainanga River were platforms of sticks and twigs in the tops of trees (mostly kopi, *Corynocarpus laevigatus*). Nests at the other colonies were in amongst clumps of flax (*Phormium tenax*) growing at the side of lakes and were built mostly of grass and flax fibre.

During bird surveys in 1961, B.D. Bell (pers. comm.) found 7 colonies of black shag. He counted nests at 5 colonies, and recorded 160 breeding pairs. Colonies were found at Lake Kaimoumi (43 nests), Lake Wharemanu (68), Lake Wharo (24), Lake Rotokawau (11), and the Flax Pond (14). Nests were not counted at the Lake Rangitai and Lake Matangirau colonies. The Lake Matangirau colony on the southern tablelands was not surveyed during 1997. If it still exists, the number of breeding pairs of black shag in the Chatham Islands would be over 233.

Of 7 colonies located in 1961, the 3 at Lakes Wharo, Rotokawau, and Rangitai were not present in 1997, probably because cattle had fed on and killed the flax on the lake shores. At Lake Wharemanu, part of the colony was abandoned when cattle killed the shoreline flax, but the remainder was within the Ocean Mail Scenic Reserve so it may persist. At only 1 of the 3 colonies present in both 1961 and 1997, have numbers increased. The Flax Pond colony increased from 15 to 56 pairs, possibly as a result of birds moving from the abandoned colonies at Lakes Rotokawau and Wharo. The Lake Wharemanu colony had declined slightly (68 to 45), whilst the Lake Kaimoumi colony had remained stable (43 to 46). Two new colonies at Okawa Point and the lower Te Awainanga River contain together, more than 30% of the pairs, possibly as a result of the abandonment of other colonies. Therefore, in the 36 years after 1961, it appears that black shag numbers have remained stable, but some colonies have moved.

Chatham Island shag *Leucocarbo onslowi*

The Chatham Island shag was the most numerous of the 3 species in the group during 1997/98, with a total of 842 pairs. However, as this is the world population of this

species, it must be regarded as vulnerable in terms of IUCN criteria (Collar *et al.* 1994). The birds were nesting in 10 colonies; Cape Fournier (115 nests); Ke Oreao Point [on an offshore rock stack] (7); Point Weeding (6); Nga-toka Turua [Ngatikitiki Rocks] (38); Matarakau (53); Okawa Point (114); Shag Rock [a limestone outcrop off Motuhinahina Island, Te Whanga Lagoon] (68); Rabbit Island (83); North-east Reef [off North Head, Pitt Island] (19); and the Star Keys (339) (Fig. 2).

Colonies were found on the top of rocky knolls, headlands, or on offshore rock stacks where there were almost level platforms. Nests were stacks of seaweed (mainly *Macrocystis pyrifera*), Chatham Island ice plant (*Disphyma papillatum*), and other vegetation held together by excreta, and were about 40-55 cm in diameter. Birds readily took material from neighbouring nests for inclusion in their own. The nests were tightly packed within a colony, often being only 50 cm apart.

At 7 of the 10 sites where Chatham Island shags nest (Point Weeding, Ngatikitiki Rocks, Matarakau, Okawa Point, Shag Rock, Rabbit Island, and the Star Keys), Pitt Island shags breed also. However, because the Pitt Island shag prefers to nest on ledges and in holes in steep cliffs, the colonies of the 2 species do not coincide.

Although pairs at all Chatham Island shag colonies have not been counted systematically during 1 season, visiting ornithologists have provided counts at some colonies with which comparisons can be made. In 1961, B.D. Bell (pers. comm.) counted most colonies on Chatham Island. At that time birds were found at Manakau Point (80 nests), Okawa Point (68), Matarakau (c.50), Nga-toka Turua (c.37), Whangamoe (5), and Point Weeding (10) (Imber 1994). In addition, birds were known to be breeding at Shag Rock, but the colony was not counted (B.D. Bell, pers. comm.). In 1968, D.V. Merton (pers. comm.) visited Rabbit Island and counted c.80 nests. C.J.R. Robertson (pers. comm.) counted 358 nests on the Star Key in 1977. By 1967, the Manakau Point colony had been abandoned and birds were breeding again at Cape Fournier, where Bell, in 1961, had recorded an abandoned colony that Fleming had earlier found to be active. The total number of pairs remained the same throughout the successive shifts (Imber 1994). During the 16-year period from 1961, no other colonies were known (B.D. Bell, pers. comm.). So the total population during the 1960s and 1970s was about 688 pairs, excluding the colony at Shag Rock. The Chatham Island shag population appears to have increased by about 12% from 688 in the 1960s and 1970s to 774 in 1997/98 (excluding the Shag Rock colony).

The number of colonies has remained the same over the 40 years since 1960, but some of their locations have changed. Colonies at Manakau Point and Whangamoe have disappeared. New colonies have been established at Ke Oreao Point, the North East Reef, and Cape Fournier. The latter colony was established by 1967, but had been abandoned by 1988, with the birds apparently then nesting on The Pinnacles. This site was then abandoned and birds were found nesting at a new site at Cape Fournier in 1991 (B.D. Bell, pers. comm.; Imber 1994).

Colonies at Matarakau, Point Weeding, Nga-toka Turua, Rabbit Island and the Star Keys have all remained relatively stable. The colony at Okawa Point has increased from 68 to 114 nests, and the Cape Fournier colony has increased from 80 to 115 nests.

The principal reason for the disappearance of colonies has probably been disturbance, mainly by stock and people. However, the effect of introduced mammalian predators on the Chatham Island shag is unknown. The 3 new colonies are at isolated inaccessible locations, with 2 on offshore rock stacks and 1 below steep cliffs inaccessible to stock and all but the keenest and most agile people.

The colony at the Star Keys has been displaced from its original location by disturbance from an increasing New Zealand fur seal (*Arctocephalus forsteri*) population, and seals have also invaded the new nesting site. The shag colony at Okawa Point is also suffering from disturbance by fur seals as their numbers increase at the nearby rookery at Point Munning.

Pitt Island shag *Stictocarbo featherstoni*

The breeding population of the Pitt Island shag numbered 729 pairs in 1997/98, in 63 colonies of 1-40 pairs. Birds bred on Chatham, Pitt, South East, Mangere, Little Mangere, the Castle, some of the Murumuru Rocks, the Star Keys, The Forty Fours, and The Sisters.

During the census a small colony (11 nests) was found on Shag Rock, a limestone outcrop off Motuhinahina Island in Te Whanga lagoon. This is the first time Pitt Island shags have been recorded breeding within the lagoon, which represents a new breeding habitat for the species.

As shown in Fig. 3, the colonies of the Pitt Island shags were distributed fairly evenly along the coasts of

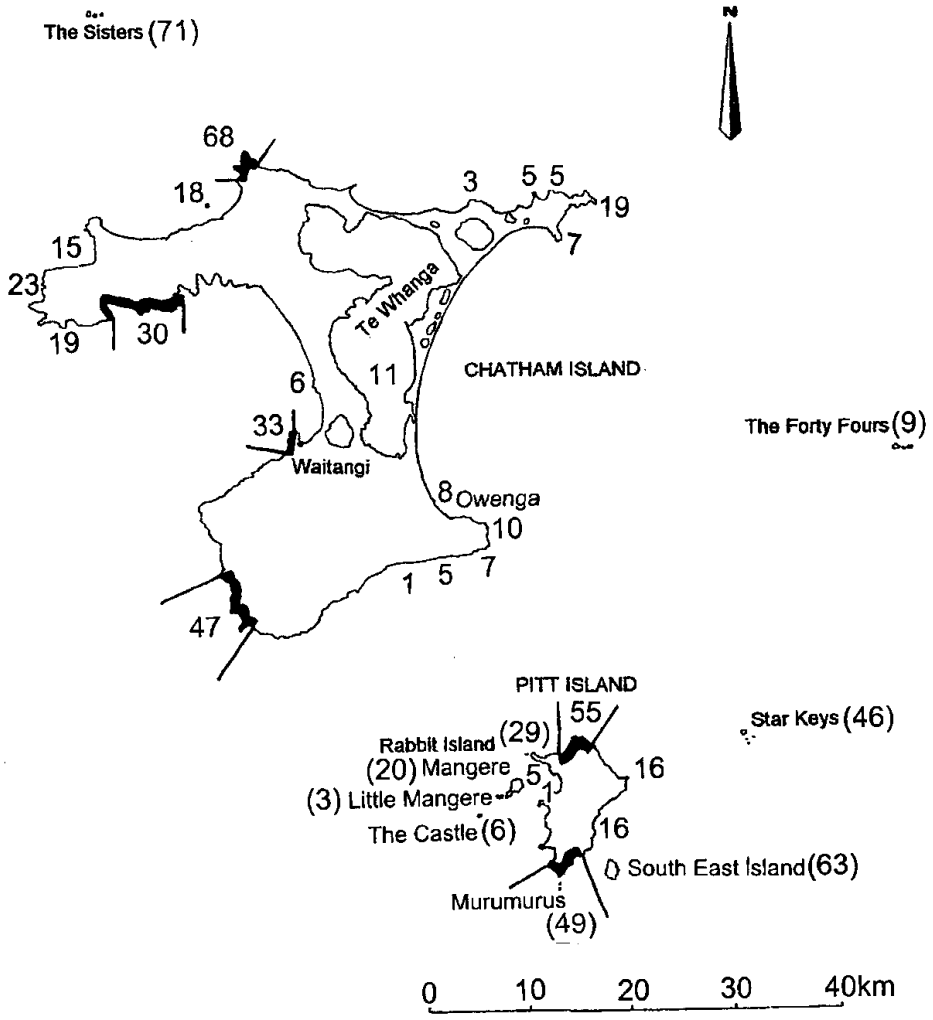

Fig. 3 Location of Pitt Island shag (*Stictocarbo featherstoni*) colonies with number of nests in 1997/98.

the Chatham Islands, there being similar numbers of pairs breeding north (381 pairs) and south (309) of Pitt Strait.

Pitt Island shag colonies consisted of loose groupings of nesting pairs up to 20 m apart, in contrast to the more compact tight colonies of both Chatham Island and black shags. Nests were built in eroded pockets, cracks and ledges on coastal cliffs. Nests were low mounds (30-40 cm in diameter) composed of seaweed (mainly *Macrocystis pyrifera*), Chatham Island ice plant (*Disphyma papillatum*), grasses and other vegetation. We have observed that some colonies appear to have been relativity mobile over consecutive years, the birds readily shifting to a new site for no apparent reason. In many instances, breeding birds have returned to a former, abandoned, site, several years later.

Apart from a few, infrequent, counts of nests at some colonies by visiting ornithologists, very little is known about the former population status of this species. The few available counts and the mobility of many breeding birds between seasons, it is presently impossible to determine a population trend for this species.

Colonies of Pitt Island shags that are accessible to introduced mammalian predators appear to suffer reduced breeding success as a result of predation. One small colony along the Port Hutt coast failed completely apparently as a result of predation of young chicks by feral cats.

Threats to shags

Populations of shags in the Chatham Islands are threatened by loss of breeding habitat, human persecution (both deliberate and accidental), and the effects of introduced predators. Of these, the loss of breeding habitat is probably the most serious. The destruction of shoreline flax by cattle has caused black shag colonies to be abandoned. Black shag nests are protected only in the 2 colonies in the Ocean Mail Scenic Reserve. Colonies of Chatham Island shags have been deserted as a result of disturbance by stock and people. There are no Chatham Island shag colonies in reserves, although the isolation of some colonies provides a measure of protection. The Pitt Island shag colonies on South East and Mangere islands are protected by the status of these islands.

Colonies at Point Munning are protected within this Scenic Reserve, and several colonies are protected within the Scenic Reserve of southern Pitt Island. Given that so few colonies are on legally protected land, and that habitats outside protected areas continue to deteriorate, habitat destruction by stock (cattle and sheep) poses a threat to the long-term conservation of the 2 endemic shags of the Chatham Islands and a significant threat to the long term viability of the black shag population as well.

Until recently, residents shot all 3 species regularly. Generally this was not because shags were believed to affect fish stocks, but because shags were highly visible and offered a 'good target'. Fortunately, the shooting of shags is now rare and poses less of a threat.

Pitt Island shags occasionally drown in freshly-baited crayfish pots. During 6 months working on a crayfish boat from October 1997 to March 1998, DB found 2 Pitt Island shags drowned in pots. When a freshly-baited pot was dropped back into the sea, the bait attracted small fish into the pot, and shags were trapped attempting to catch the fish. During January and February when pots are set in shallow water following the inshore movement of crayfish, the fishermen questioned said they usually caught 1 or 2 shags each year. There are about 40 fishing boats working the waters around the Chathams, so 40-80 Pitt Island shags may be killed annually. Chatham Island and black shags are rarely caught in pots.

The survey during the 1997/98 breeding season provided the first population census of Chatham Island, Pitt Island and black shags in the Chathams. The results provide a basis for future censuses and hopefully the work can be repeated. Regular monitoring would allow trends in the populations to be determined and would ensure that any changes in population numbers or structure would be observed early enough for management techniques to be implemented. This is particularly important for the 2 endemic species.

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LITERATURE CITED

Collar, N.J.; Crosby, M.J; Stattersfield, A.J. 1994. Birds to watch, 2: the world list of threatened birds. *Birdlife International conservation series no. 4.*

Imber, M.J. 1994. Seabirds recorded at the Chatham Islands, 1960-May 1993. *Notornis 41 (supplement)*: 97-108.

Robertson, C.J.R.; Bell, B.D. 1984. Seabird status and conservation in the New Zealand region. pp. 573-586 *in*: Croxall, J.P., Evans, P.G.H., Schreiber, R.W. (*ed.*). *Status and conservation of the world's seabirds.* International Council for Bird Preservation technical publication no. 2.